# Elm Avenue/Kains Avenue

### TRAFFIC SIGNAL WARRANTS WORKSHEET

					Analyst:	ΟZ	date:	3/5/19	
Major Street:	Kains Avenue		С	ritical A	pproach	Speed	* (mph)	25	ı.
Minor Street:	Elm Avenue		С	ritical A	pproach	Speed	* (mph)	25	•
					•	•		Speed.	
Critical	speed of major street traffic > 50 mph (64 km/h)			_					
In built	up area of isolated community of < 10,000 population		or }	Rural (	R)				
in built	up area or isolated community of a re,ooc population		. <u> </u>	Urban (	(LI)				
	AM PEAK PER	IOD		Olbali	(0)				
Warrant 3 - P	eak Hour								
PART A									
	and 3 below must be satisfied)								
, , ,	,			,	M DEAL	( PERIO	D		
				<u> </u>		LINIO		Π	
			pun	+	pun				
		ing	gro	ing	gro				
		Existing	Background	Existing - Proj	Background + Proj				
	Minor Chroat Annyoneh Direction W. High oct Delev	Ш NB	MB	MВ					
	Minor Street Approach Direction w/ Highest Delay Highest Minor Street Average Delay (sec/veh)	8.3	8.3	8.4	NB 8.4				
	Corresponding Minor Street Approach Volume (veh/hr)	107	107	107	107			<del>                                     </del>	
	Minor Street Total Delay (veh-hrs)	0.2	0.2	0.2	0.2				
	3,7								
	al delay experienced for traffic on one minor street approach								
	led by a STOP sign equals or exceeds 4 vehicle-hours for a 1-	No	No	No	No				
lane ap	pproach and 5 vehicle-hours for a 2-lane approach; AND	NO	INO	NO	NO				
	lume on the same minor street approach equals or exceeds								
100 vp AND	h for 1 moving lane of traffic or 150 vph for 2 moving lanes;	Yes	Yes	Yes	Yes				
	all entering volume serviced during the hour equals or								
	Is 800 vph for intersections with 4 or more approaches or 650 intersections with 3 approaches.	No	No	No	No				
	Signal Warranted based on Part A?	No	No	No	No				

# PART B

						А	M PEA	( PERIO	D	
		Appr Lai	oach nes 2 or More	Existing	Background	Existing + Proj	Background + Proj			
Major Street - Both Approaches	Kains Avenue	Х		193	197	222	226			
Minor Street - Highest Approach	Elm Avenue	Х		107	107	107	107			
	Signal Warranted ba	sed on I	Part B?	No	No	No	No			

The Warrant is satisfied if the plotted point for vehicles per hour on the major street (both approaches) and the corresponding per hour higher vehicle volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) fall above the applicable curves in California MUTCD Figure 4C-3 or 4C-4.

Source: California Manual on Uniform Traffic Control Devices for Streets and Highways 2014 Edition (FHWA's MUTCD 2009 Edition, including Revisions 1 & 2, as amended for use in California).

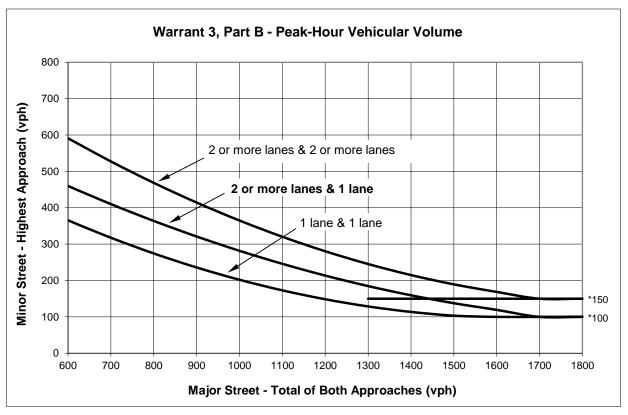
Notes:

File: Signal Warrant Analysis - Elm Ave\_Kains Ave.xlsm

Tab: Signal Warrants 3 (AM)

### Elm Avenue and Kains Avenue

**AM PEAK PERIOD** 



Source: Figure 4C-3 California Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD 2010 Edition, as amended for use in California).

Warrant 3, Part B - Peak-Hour Vehicular Volume

					AM PE	EAK PI	ERIOD		
		roach nes 2 or More	Existing	Background	Existing + Proj	Background + Proj			
Major Street - Both Approaches Kains Avenue	Х		193	197	222	226			
Minor Street - Highest Approach Elm Avenue	х		107	107	107	107			
Signal Warranted Based on Part B - Peak-Ho	ur Volu	ımes?	No	No	No	No			

<sup>\*</sup>Warrant is satisfied if plotted points fall above the appropriate curve in graph above.

File: Signal Warrant Analysis - Elm Ave\_Kains Ave.xlsm

<sup>\*</sup> Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

# Elm Avenue/Kains Avenue

## TDAEEIC SIGNAL WADDANTS WODKSHEET

	I RAFFIC SIGNAL WARF	KANIS	WOR	VOHER	: 1				
					Analyst			3/5/19	•
Major Street:	Kains Avenue		Cı	ritical Ap	proach	Speed'	* (mph)	25	•
Minor Street:	Elm Avenue		Cı	ritical Ap	proach	•			
Critical	speed of major street traffic > 50 mph (64 km/h)		□ 1				"Postea	Speed.	
			or >	Rural (	R)				
in built	up area of isolated community of < 10,000 population				/I IV				
	PM PEAK HO	UR	<b>✓</b>	Urban (	(U)				
Warrant 3 - P	eak Hour								
PART A (All parts 1, 2,	and 3 below must be satisfied)								
					PM PEA	K HOUF	2		
			pund	+	pund				
		Existing	Background	Existing - Proj	Background + Proj				
	Min on Charact American Birnation will like heat Dalay								
	Minor Street Approach Direction w/ Highest Delay Highest Minor Street Average Delay (sec/veh)	NB 8.0	NB 8.0	NB 8.1	NB 8.1			-	
	Corresponding Minor Street Approach Volume (veh/hr)	76	76	76	76				
	Minor Street Total Delay (veh-hrs)	0.2	0.2	0.2	0.2			-	
	Willion Officer Total Delay (Ventilia)	0.2	0.2	0.2	0.2			<del>                                     </del>	
control	ral delay experienced for traffic on one minor street approach led by a STOP sign equals or exceeds 4 vehicle-hours for a 1-proach and 5 vehicle-hours for a 2-lane approach; AND								
		No	No	No	No				
	lume on the same minor street approach equals or exceeds h for 1 moving lane of traffic or 150 vph for 2 moving lanes;	Vac	Vac	Vac	Vac				
3 The tot	al entering volume serviced during the hour equals or	Yes	Yes	Yes	Yes			<del>                                     </del>	
	ds 800 vph for intersections with 4 or more approaches or 650								
	intersections with 3 approaches.	No	No	No	No				
	Signal Warranted based on Part A?	No	No	No	No				
					•	•			

#### PART B

				-			PM PEA	K HOUF	₹	
			oach nes 2 or More	Existing	Background	Existing + Proj	Background + Proj			
Major Street - Both Approaches	Kains Avenue	Χ		186	188	207	209			
Minor Street - Highest Approach	Elm Avenue	Χ		80	80	83	83			
	Signal Warranted ba	sed on l	Part B?	No	No	No	No			

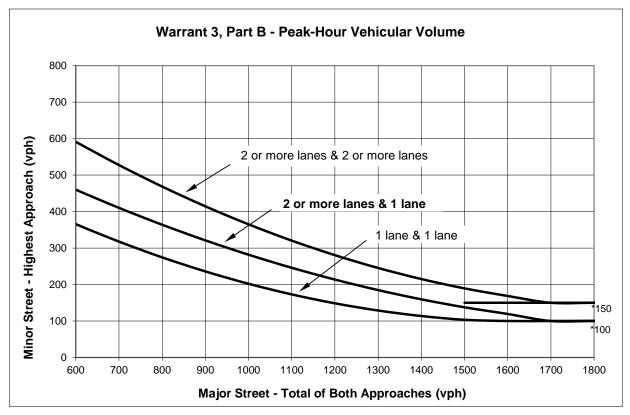
The Warrant is satisfied if the plotted point for vehicles per hour on the major street (both approaches) and the corresponding per hour higher vehicle volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) fall above the applicable curves in California MUTCD Figure 4C-3 or 4C-4.

Source: California Manual on Uniform Traffic Control Devices for Streets and Highways 2014 Edition (FHWA's MUTCD 2009 Edition, including Revisions 1 & 2, as amended for use in California). Notes:

File: Signal Warrant Analysis - Elm Ave\_Kains Ave.xlsm Tab: Signal Warrants 3 (PM)

### Elm Avenue and Kains Avenue

PM PEAK HOUR



Source: Figure 4C-3 California Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD 2010 Edition, as amended for use in California).

Warrant 3, Part B - Peak-Hour Vehicular Volume

					PM F	EAK F	HOUR		
		oach nes	Existing	Background	ing + oj	Background + Proj			
	One	2 or More	Exis	Backg	Existing Proj	Backç + F			
Major Street - Both Approaches Kains Avenue	X		186	188	207	209			
Minor Street - Highest Approach Elm Avenue	Х		80	80	83	83			
Signal Warranted Based on Part B - Peak-Ho	our Volu	ımes?	No	No	No	No			

<sup>\*</sup>Warrant is satisfied if plotted points fall above the appropriate curve in graph above.

File: Signal Warrant Analysis - Elm Ave\_Kains Ave.xlsm

<sup>\*</sup> Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

### Linden Avenue/Angus Avenue

## TRAFFIC SIGNAL WARRANTS WORKSHEET

Material			_		Analyst:			3/5/19	•
Major Street:	Angus Avenue			ritical A		•			•
Minor Street:	Linden Avenue		С	ritical A <sub>l</sub>	oproach	•			
Critical	speed of major street traffic > 50 mph (64 km/h)		$\Box$				*Posted	Speed.	
			or >	Rural (	R)				
In built	up area of isolated community of < 10,000 population		. ロノ						
	AM DEAK DED		<b>✓</b>	Urban (	(U)				
	AM PEAK PER	IOD							
Warrant 3 - Po	eak Hour								
Wallant 5 - 1	cur i i di								
PART A									
(All parts 1, 2,	and 3 below must be satisfied)								
				_	M PEAK	( PERIO	D		
			_	1		t i Litio			
			pun	+	Pun				
		ng	gro	ng	gro				
		Existing	Background	Existing - Proj	Background + Proj				
	Minor Street Approach Direction w/ Highest Delay	NB	NB	NB	NB			<u> </u>	
	Highest Minor Street Average Delay (sec/veh)	7.7	7.7	7.7	7.7			ļ	
	Corresponding Minor Street Approach Volume (veh/hr)	62	62	62	62			ļ	
	Minor Street Total Delay (veh-hrs)	0.1	0.1	0.1	0.1				
1 The tot	al delay experienced for traffic on one minor street approach							<del>                                     </del>	
	led by a STOP sign equals or exceeds 4 vehicle-hours for a 1-								
	proach and 5 vehicle-hours for a 2-lane approach; AND	No	No	No	No				
·									
2. The vo	lume on the same minor street approach equals or exceeds							-	
	h for 1 moving lane of traffic or 150 vph for 2 moving lanes;	No	No	No	No				
<u>AND</u>		110	110	140	110				
3. The tot	al entering volume serviced during the hour equals or								
exceed	s 800 vph for intersections with 4 or more approaches or 650	No	No	No	No				
vph for	intersections with 3 approaches.								
	Signal Warranted based on Part A?	No	No	No	No			-	

# PART B

						А	M PEA	( PERIO	D	
		Appr Lar One	oach nes 2 or More	Existing	Background	Existing + Proj	Background + Proj			
Major Street - Both Approaches	Angus Avenue	Х		207	207	208	208			
Minor Street - Highest Approach	Linden Avenue	Х		62	62	62	62			
	Signal Warranted ba	sed on I	Part B?	No	No	No	No			

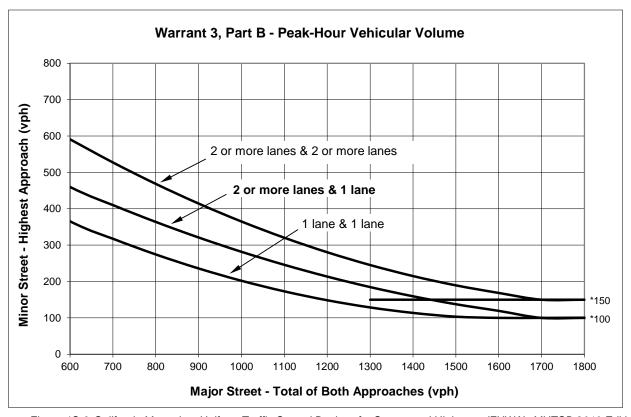
The Warrant is satisfied if the plotted point for vehicles per hour on the major street (both approaches) and the corresponding per hour higher vehicle volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) fall above the applicable curves in California MUTCD Figure 4C-3 or 4C-4.

Source: California Manual on Uniform Traffic Control Devices for Streets and Highways 2014 Edition (FHWA's MUTCD 2009 Edition, including Revisions 1 & 2, as amended for use in California).

Notes:

File: Signal Warrant Analysis - Linden Ave\_Angus Ave.xlsm

Tab: Signal Warrants 3 (AM)



Source: Figure 4C-3 California Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD 2010 Edition, as amended for use in California).

Warrant 3, Part B - Peak-Hour Vehicular Volume

					AM PE	EAK PI	ERIOD		
		oach nes 2 or More	Existing	Background	Existing + Proj	Background + Proj			
Major Street - Both Approaches Angus Avenue	Х		207	207	208	208			
Minor Street - Highest Approach Linden Avenue	Х		62	62	62	62			
Signal Warranted Based on Part B - Peak-Ho	ur Volu	mes?	No	No	No	No			

<sup>\*</sup>Warrant is satisfied if plotted points fall above the appropriate curve in graph above.

File: Signal Warrant Analysis - Linden Ave\_Angus Ave.xlsm

<sup>\*</sup> Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

### Linden Avenue/Angus Avenue

	TRAFFIC SIGNAL WARF	RANTS	WOR	KSHEE	T				
					Analyst	OZ	date:	3/5/19	
Major Street:	Angus Avenue		C	ritical Ap	proach	Speed'	(mph)	25	
Minor Street:	Linden Avenue		Cı	ritical Ap	proach	Speed'	(mph)	25	
							*Posted	Speed.	
Critica	I speed of major street traffic > 50 mph (64 km/h)		or }	Dural (	D)				
In built	up area of isolated community of < 10,000 population		∐ ∫	Rural (	K)				
	, , , , , ,		7	Urban	(U)				
	PM PEAK HO	UR			(-)				
Warrant 3 - P	Peak Hour								
PART A (All parts 1, 2,	and 3 below must be satisfied)								
	,				PM PEA	K HOUR	<b>{</b>		
			ъ		ъ				
		_	unc	+	unc				
		sting	kgr	sting	ackgr Proj				
		Existing	Background	Existing + Proj	Background + Proj				
	Minor Street Approach Direction w/ Highest Delay	NB	NB	NB	NB				
	Highest Minor Street Average Delay (sec/veh)	7.4	7.4	7.4	7.4				
	Corresponding Minor Street Approach Volume (veh/hr)	55	55	55	55				
	Minor Street Total Delay (veh-hrs)	0.1	0.1	0.1	0.1				
4. The te	tol delay avacuianced for traffic on one miner atract approach								
	tal delay experienced for traffic on one minor street approach lled by a STOP sign equals or exceeds 4 vehicle-hours for a 1-								
	pproach and 5 vehicle-hours for a 2-lane approach; AND	No	No	No	No				
2. The vo	olume on the same minor street approach equals or exceeds								
	oh for 1 moving lane of traffic or 150 vph for 2 moving lanes;	No	No	No	No				
AND		110	110	110	110				
3. The to	tal entering volume serviced during the hour equals or								
	ds 800 vph for intersections with 4 or more approaches or 650	No	No	No	No				
vph for	r intersections with 3 approaches.								
	Signal Warranted based on Part A?	No	No	No	No				
	- <b>3</b>					I			

# PART B

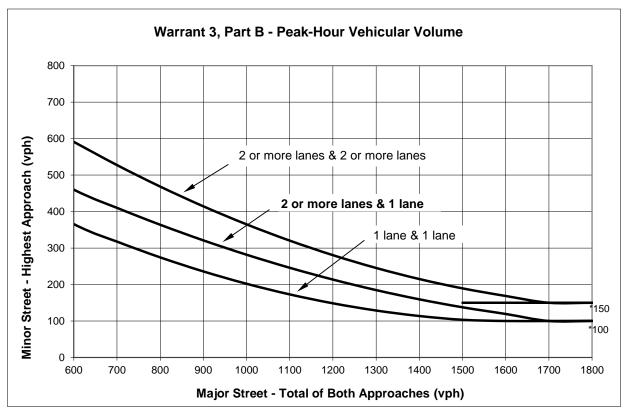
				-			PM PEA	K HOUF	₹	
			roach nes 2 or More	Existing	Background	Existing + Proj	Background + Proj			
Major Street - Both Approaches	Angus Avenue	Х		78	78	79	79			
Minor Street - Highest Approach	Linden Avenue	Χ		55	55	55	55			
	Signal Warranted ba	sed on l	Part B?	No	No	No	No			

The Warrant is satisfied if the plotted point for vehicles per hour on the major street (both approaches) and the corresponding per hour higher vehicle volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) fall above the applicable curves in California MUTCD Figure 4C-3 or 4C-4.

Source: California Manual on Uniform Traffic Control Devices for Streets and Highways 2014 Edition (FHWA's MUTCD 2009 Edition, including Revisions 1 & 2, as amended for use in California). Notes:

File: Signal Warrant Analysis - Linden Ave\_Angus Ave.xlsm Tab: Signal Warrants 3 (PM)

PM PEAK HOUR



Source: Figure 4C-3 California Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD 2010 Edition, as amended for use in California).

Warrant 3, Part B - Peak-Hour Vehicular Volume

					PM P	EAK F	HOUR		
		oach nes	Existing	Background	ing + oj	Background + Proj			
	One	2 or More	Exis	Backg	Existing Proj	Backç + F			
Major Street - Both Approaches Angus Avenue	X		78	78	79	79			
Minor Street - Highest Approach Linden Avenue	X		55	55	55	55			
Signal Warranted Based on Part B - Peak-Ho	ur Volu	mes?	No	No	No	No			

<sup>\*</sup>Warrant is satisfied if plotted points fall above the appropriate curve in graph above.

File: Signal Warrant Analysis - Linden Ave\_Angus Ave.xlsm

<sup>\*</sup> Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

# Linden Avenue/Kains Avenue

#### TRAFFIC SIGNAL WARRANTS WORKSHEET

Major Street: Kains Avenue Critical Approach Speed* (mph) 25   Linden Avenue Critical Approach Speed* (mph) 25   Critical speed of major street traffic > 50 mph (64 km/h)		TIVALLIC SIGNAL WANT	\AI1   3	WOIN	COLICE					
Minor Street: Linden Avenue Critical Approach Speed* (mph) 25 *Posted Speed.  Critical speed of major street traffic > 50 mph (64 km/h)						•				•
Critical speed of major street traffic > 50 mph (64 km/h)	Major Street:	Kains Avenue		С	ritical A <sub>l</sub>	oproach	Speed	* (mph)	25	
Critical speed of major street traffic > 50 mph (64 km/h)	Minor Street:	Linden Avenue		С	ritical A <sub>l</sub>	proach	Speed	* (mph)	25	
In built up area of isolated community of < 10,000 population								*Posted	Speed.	•
Marrant 3 - Peak Hour  PART A (All parts 1, 2, and 3 below must be satisfied)  Minor Street Approach Direction w/ Highest Delay   SB   SB   SB   Highest Minor Street Average Delay (sec/veh)   9,9   10.0   10.1   10.2   Corresponding Minor Street Approach Outme (veh/hn)   7   7   7   7   7   Minor Street Total Delay (veh-hrs)   0.0   0.0   0.0   0.0    1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds 100 yph for 1 moving lane of traffic or 150 vph for 2 moving lanes; AND  3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with 4 or more approaches or 650 vph for intersections with 3 approaches.	Critical	speed of major street traffic > 50 mph (64 km/h)			_					
Warrant 3 - Peak Hour  PART A (All parts 1, 2, and 3 below must be satisfied)  Minor Street Approach Direction w/ Highest Delay BB SB	In built	up area of isolated community of < 10 000 population		or	Rural (	R)				
Warrant 3 - Peak Hour  PART A (All parts 1, 2, and 3 below must be satisfied)  Minor Street Approach Direction w/ Highest Delay   SB SB SB SB   Highest Minor Street Aperoach Volume (veh/hr)   7   7   7   7   Minor Street Approach Volume (veh/hr)   7   7   7   7    The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds 4 vehicle-hours for a 1-lane approach and 5 vehicle-hours for a 2-lane approach; AND  1. The total delay experienced for traffic or 150 vph for 2 moving lanes; AND  2. The volume on the same minor street approach equals or exceeds 100 vph for 1 moving lane of traffic or 150 vph for 2 moving lanes; AND  3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with 4 or more approaches or 650 vph for intersections with 3 approaches.	iii buiit	up area or isolated community of \$ 10,000 population		. 🗆 🥕	Urban	111				
Warrant 3 - Peak Hour  PART A (All parts 1, 2, and 3 below must be satisfied)  AM PEAK PERIOD  AM PEAK PERIOD  Minor Street Approach Direction w/ Highest Delay   SB		AM DEAK DED	IOD	Ľ	Ulbali	(0)				
AM PEAK PERIOD  AM PEAK PERIOD  Minor Street Approach Direction w/ Highest Delay SB		AWIFLANTLN	IOD							
AM PEAK PERIOD    AM PEAK PERIOD   AM PEAK PEAK PERIOD   AM PEAK PERIOD   AM PEAK PEAK PERIOD   AM PEAK PERIOD   AM PEAK PERI	Warrant 3 - P	eak Hour								
AM PEAK PERIOD    Minor Street Approach Direction w/ Highest Delay   SB   SB   SB   SB   Highest Minor Street Average Delay (sec/veh)   9.9   10.0   10.1   10.2	Warrant 5 - 1	car rioui								
AM PEAK PERIOD    Minor Street Approach Direction w/ Highest Delay   SB   SB   SB   SB   Highest Minor Street Average Delay (sec/veh)   9.9   10.0   10.1   10.2	PART A									
AM PEAK PERIOD    Part   Part		and 3 below must be satisfied)								
Minor Street Approach Direction w/ Highest Delay   SB   SB   SB   SB   Highest Minor Street Average Delay (sec/veh)   9.9   10.0   10.1   10.2    Corresponding Minor Street Approach Volume (veh/hr)   7   7   7   7   7   7   7   7   7	•					MOEAL	/ DEDIO	ь.		
Minor Street Approach Direction w/ Highest Delay SB SB SB SB Highest Minor Street Average Delay (sec/veh) 9.9 10.0 10.1 10.2 Corresponding Minor Street Approach Volume (veh/hr) 7 7 7 7 7 7				I	1		PERIO	ט ו	T	
Minor Street Approach Direction w/ Highest Delay SB SB SB SB Highest Minor Street Average Delay (sec/veh) 9.9 10.0 10.1 10.2 Corresponding Minor Street Approach Volume (veh/hr) 7 7 7 7 7 7				pu	l .	pu				
Minor Street Approach Direction w/ Highest Delay SB SB SB SB Highest Minor Street Average Delay (sec/veh) 9.9 10.0 10.1 10.2 Corresponding Minor Street Approach Volume (veh/hr) 7 7 7 7 7 7			D D	l o	<u>6</u>	no.				
Minor Street Approach Direction w/ Highest Delay SB SB SB SB Highest Minor Street Average Delay (sec/veh) 9.9 10.0 10.1 10.2 Corresponding Minor Street Approach Volume (veh/hr) 7 7 7 7 7 7			stir	Ş	stir oj	ğ. Ö.				
Minor Street Approach Direction w/ Highest Delay SB SB SB SB Highest Minor Street Average Delay (sec/veh) 9.9 10.0 10.1 10.2 Corresponding Minor Street Approach Volume (veh/hr) 7 7 7 7 7 7			ËXi	Ba	P. P.	Ba( + F				
Corresponding Minor Street Approach Volume (veh/hr) 7 7 7 7		Minor Street Approach Direction w/ Highest Delay	SB	SB						
Minor Street Total Delay (veh-hrs) 0.0 0.0 0.0 0.0 0.0  1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds 4 vehicle-hours for a 1-lane approach and 5 vehicle-hours for a 2-lane approach; AND No		Highest Minor Street Average Delay (sec/veh)	9.9	10.0	10.1	10.2				
1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds 4 vehicle-hours for a 1-lane approach and 5 vehicle-hours for a 2-lane approach; AND  2. The volume on the same minor street approach equals or exceeds 100 vph for 1 moving lane of traffic or 150 vph for 2 moving lanes; No		Corresponding Minor Street Approach Volume (veh/hr)	7	7	7	7				
controlled by a STOP sign equals or exceeds 4 vehicle-hours for a 1-lane approach and 5 vehicle-hours for a 2-lane approach; AND  2. The volume on the same minor street approach equals or exceeds 100 vph for 1 moving lane of traffic or 150 vph for 2 moving lanes; No vph for intersections with 4 or more approaches or 650 vph for intersections with 3 approaches.		Minor Street Total Delay (veh-hrs)	0.0	0.0	0.0	0.0				
controlled by a STOP sign equals or exceeds 4 vehicle-hours for a 1-lane approach and 5 vehicle-hours for a 2-lane approach; AND  2. The volume on the same minor street approach equals or exceeds 100 vph for 1 moving lane of traffic or 150 vph for 2 moving lanes; No vph for intersections with 4 or more approaches or 650 vph for intersections with 3 approaches.									ļ	
lane approach and 5 vehicle-hours for a 2-lane approach; AND  2. The volume on the same minor street approach equals or exceeds 100 vph for 1 moving lane of traffic or 150 vph for 2 moving lanes; No										
2. The volume on the same minor street approach equals or exceeds 100 vph for 1 moving lane of traffic or 150 vph for 2 moving lanes; AND  3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with 4 or more approaches or 650 vph for intersections with 3 approaches.			No	No	No	No				
100 vph for 1 moving lane of traffic or 150 vph for 2 moving lanes;  AND  3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with 4 or more approaches or 650 vph for intersections with 3 approaches.	iane ap	proach and 5 vehicle-flours for a 2-lane approach, AND	1.0	110	110	110				
100 vph for 1 moving lane of traffic or 150 vph for 2 moving lanes;  AND  3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with 4 or more approaches or 650 vph for intersections with 3 approaches.									<u> </u>	
AND  3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with 4 or more approaches or 650 vph for intersections with 3 approaches.										
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with 4 or more approaches or 650 vph for intersections with 3 approaches.		n for a moving lane of trainic or 150 vpn for 2 moving lanes;	No	No	No	No				
exceeds 800 vph for intersections with 4 or more approaches or 650 No No No No No vph for intersections with 3 approaches.										
vph for intersections with 3 approaches.										
			No	No	No	No				
Signal Warranted based on Part A? No No No No	vpi1101	intersections with a approaches.							<del></del>	
		Signal Warranted based on Part A?	No	No	No	No				

### PART B

						А	M PEA	( PERIO	D	
		Appr Lai One	oach nes 2 or More	Existing	Background	Existing + Proj	Background + Proj			
Major Street - Both Approaches	Kains Avenue	Х		151	155	180	184			
Minor Street - Highest Approach	Linden Avenue	Χ		67	67	68	68			
	Signal Warranted ba	sed on I	Part B?	No	No	No	No			

The Warrant is satisfied if the plotted point for vehicles per hour on the major street (both approaches) and the corresponding per hour higher vehicle volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) fall above the applicable curves in California MUTCD Figure 4C-3 or 4C-4.

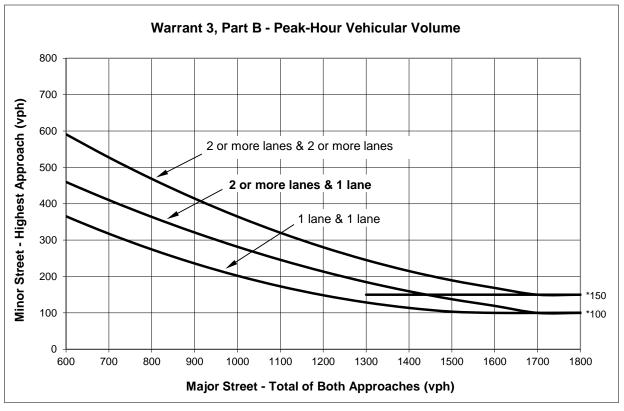
Source: California Manual on Uniform Traffic Control Devices for Streets and Highways 2014 Edition (FHWA's MUTCD 2009 Edition, including Revisions 1 & 2, as amended for use in California).

Notes:

File: Signal Warrant Analysis - Linden Ave\_Kains Ave.xlsm Tab: Signal Warrants 3 (AM)

### Linden Avenue and Kains Avenue

**AM PEAK PERIOD** 



Source: Figure 4C-3 California Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD 2010 Edition, as amended for use in California).

Warrant 3, Part B - Peak-Hour Vehicular Volume

					AM PE	EAK PI	ERIOD		
		roach nes 2 or More	Existing	Background	Existing + Proj	Background + Proj			
Major Street - Both Approaches Kains Avenue	X		151	155	180	184			
Minor Street - Highest Approach Linden Avenue	х		67	67	68	68			
Signal Warranted Based on Part B - Peak-Ho	arranted Based on Part B - Peak-Hour Volumes?								

<sup>\*</sup>Warrant is satisfied if plotted points fall above the appropriate curve in graph above.

File: Signal Warrant Analysis - Linden Ave\_Kains Ave.xlsm

<sup>\*</sup> Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

# Linden Avenue/Kains Avenue

	TRAFFIC SIGNAL WARF	RANTS	WORI	KSHEE	Т				
					Analyst:	OZ	date:	3/5/19	
Major Street:	Kains Avenue		Cr	itical Ap	proach	Speed <sup>3</sup>	* (mph)	25	
Minor Street:	Linden Avenue		Cr	itical Ap	proach	Speed	* (mph)	25	
							*Posted	Speed.	
Critical	speed of major street traffic > 50 mph (64 km/h)		or >	Rural (I	٥١				
In built	up area of isolated community of < 10,000 population		Ŭ ∫	Kurai (i	`)				
			<b>y</b>	Urban (	U)				
	PM PEAK HO	UR			. ,				
Warrant 3 - P									
(All parts 1, 2,	and 3 below must be satisfied)								
			1	1	PM PEA	K HOUF	₹		
		Existing	Background	Existing + Proj	Background + Proj				
	Minor Street Approach Direction w/ Highest Delay	SB	SB	SB	SB			$\overline{}$	
	Highest Minor Street Average Delay (sec/veh)	10.5	10.5	10.7	10.7				
	Corresponding Minor Street Approach Volume (veh/hr)	11	11	11	11				
	Minor Street Total Delay (veh-hrs)	0.0	0.0	0.0	0.0				
control	tal delay experienced for traffic on one minor street approach led by a STOP sign equals or exceeds 4 vehicle-hours for a 1-oproach and 5 vehicle-hours for a 2-lane approach; AND	No	No	No	No				
	lume on the same minor street approach equals or exceeds h for 1 moving lane of traffic or 150 vph for 2 moving lanes;	No	No	No	No				
exceed	al entering volume serviced during the hour equals or als 800 vph for intersections with 4 or more approaches or 650 intersections with 3 approaches.	No	No	No	No				
	Signal Warranted based on Part A?	No	No	No	No				
	<b>-</b>								

### PART B

							PM PEA	K HOUF	₹	
			roach nes 2 or More	Existing	Background	Existing + Proj	Background + Proj			
Major Street - Both Approaches	Kains Avenue	Х		235	237	258	260			
Minor Street - Highest Approach	Linden Avenue	Х		41	41	42	42			
	Signal Warranted ba	sed on	Part B?	No	No	No	No			

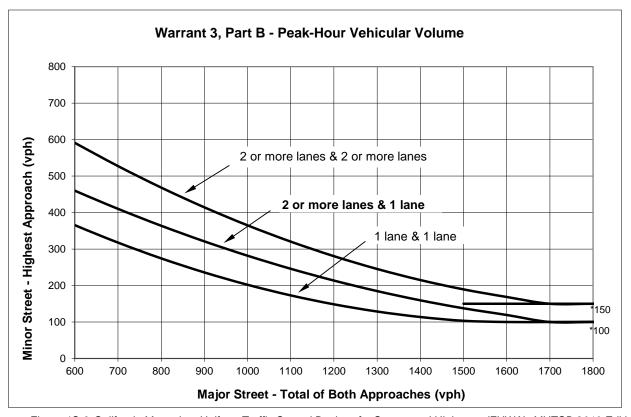
The Warrant is satisfied if the plotted point for vehicles per hour on the major street (both approaches) and the corresponding per hour higher vehicle volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) fall above the applicable curves in California MUTCD Figure 4C-3 or 4C-4.

Source: California Manual on Uniform Traffic Control Devices for Streets and Highways 2014 Edition (FHWA's MUTCD 2009 Edition, including Revisions 1 & 2, as amended for use in California). Notes:

File: Signal Warrant Analysis - Linden Ave\_Kains Ave.xlsm Tab: Signal Warrants 3 (PM)

### Linden Avenue and Kains Avenue

PM PEAK HOUR



Source: Figure 4C-3 California Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD 2010 Edition, as amended for use in California).

Warrant 3, Part B - Peak-Hour Vehicular Volume

					PM F	EAK F	HOUR		
		roach nes	Existing	Background	ing + oj	Background + Proj			
	One	2 or More	Exis	Backg	Existing Proj	Backg + F			
Major Street - Both Approaches Kains Avenue	X		235	237	258	260			
Minor Street - Highest Approach Linden Avenue	Х		41	41	42	42			
Signal Warranted Based on Part B - Peak-Ho	ur Volu	ımes?	No	No	No	No			

<sup>\*</sup>Warrant is satisfied if plotted points fall above the appropriate curve in graph above.

File: Signal Warrant Analysis - Linden Ave\_Kains Ave.xlsm

<sup>\*</sup> Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

# White Way/Kains Avenue

### TRAFFIC SIGNAL WARRANTS WORKSHEET

	Kains Avenue White Way  speed of major street traffic > 50 mph (64 km/h up area of isolated community of < 10,000 pop	ulation			itical Ap itical Ap Rural (F Urban (	oproach	Speed'	(mph)	25	
	<i>F</i>	M PEAK PER	עטו							
Warrant 3 - Pe	eak Hour									
PART A										
(All parts 1, 2,	and 3 below must be satisfied)									
		_			А	M PEAK	PERIO	D		
			Existing	Background	Existing + Proj	Background + Proj				
	Minor Street Approach Direction w/	Highest Delay	NB	NB	NB	NB				
	Highest Minor Street Average D	Delay (sec/veh)	0.0	0.0	9.3	9.3				
	Corresponding Minor Street Approach V		0	0	32	32				
	Minor Street Total I	Delay (veh-hrs)	0.0	0.0	0.1	0.1				
controlle	al delay experienced for traffic on one minor streed by a STOP sign equals or exceeds 4 vehicle proach and 5 vehicle-hours for a 2-lane approach	e-hours for a 1-	No	No	No	No				
	ume on the same minor street approach equal n for 1 moving lane of traffic or 150 vph for 2 m		No	No	No	No				
exceeds	al entering volume serviced during the hour eques 800 vph for intersections with 4 or more approximates of the sections with 3 approaches.		No	No	No	No				
	Signal Warranted bas	ed on Part A?	No	No	No	No				

### PART B

						Д	M PEA	( PERIO	D	
			roach nes 2 or More	Existing	Background	Existing + Proj	Background + Proj			
Major Street - Both Approaches	Kains Avenue	Х		199	203	238	242			
Minor Street - Highest Approach	White Way	Х		0	0	32	32			
	Signal Warranted ba	sed on I	Part B?	No	No	No	No			

The Warrant is satisfied if the plotted point for vehicles per hour on the major street (both approaches) and the corresponding per hour higher vehicle volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) fall above the applicable curves in California MUTCD Figure 4C-3 or 4C-4.

Source: California Manual on Uniform Traffic Control Devices for Streets and Highways 2014 Edition (FHWA's MUTCD 2009 Edition, including Revisions 1 & 2, as amended for use in California).

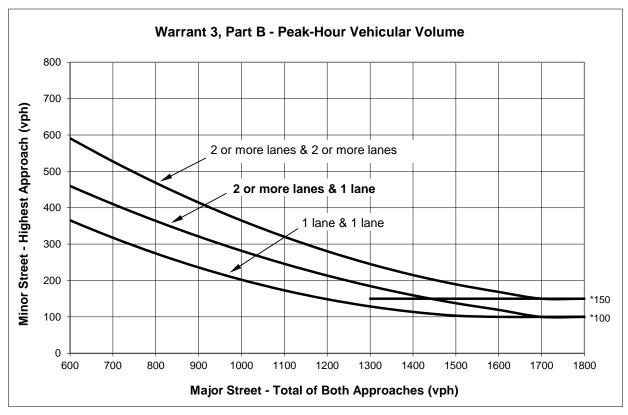
Notes:

File: Signal Warrant Analysis - White Way\_Kains Ave.xlsm

Tab: Signal Warrants 3 (AM)

### White Way and Kains Avenue

**AM PEAK PERIOD** 



Source: Figure 4C-3 California Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD 2010 Edition, as amended for use in California).

Warrant 3, Part B - Peak-Hour Vehicular Volume

					AM PE	EAK PI	ERIOD		
		oach nes 2 or More	Existing	Background	Existing + Proj	Background + Proj			
Major Street - Both Approaches Kains Avenue	Х		199	203	238	242			
Minor Street - Highest Approach White Way	Х		0	0	32	32			
Signal Warranted Based on Part B - Peak-Ho	ır Volu	mes?	No	No	No	No			

<sup>\*</sup>Warrant is satisfied if plotted points fall above the appropriate curve in graph above.

File: Signal Warrant Analysis - White Way\_Kains Ave.xlsm

<sup>\*</sup> Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

# White Way/Kains Avenue

TRAFFIC SIGNAL	WARRANIS	WOR	KOHEE	: 1				
				Analyst:	OZ	date:	3/5/19	-
Major Street: Kains Avenue		С	ritical Ap	oproach	Speed	* (mph)	25	_
Minor Street: White Way		С	ritical Ap	oproach	Speed	* (mph)	25	-
						*Posted	Speed.	
Critical speed of major street traffic > 50 mph (64 km/h)		or }	- Rural (I	R)				
In built up area of isolated community of < 10,000 population		ΔĴ	rtarar (	,				
		4	Urban (	(U)				
PM PE	AK HOUR							
Warrant 3 - Peak Hour								
PART A								
(All parts 1, 2, and 3 below must be satisfied)								
				PM PEA	K HOUF	₹		
		р		Þ				
		onu	+	Jno.				
	) tiù	kgr	- iji	ig je				
	Existing	Background	Existing + Proj	Background + Proj				
Minor Street Approach Direction w/ Highest	Delay NB	NB	NB	NB				
Highest Minor Street Average Delay (se	ec/veh) 8.8	8.8	9.2	9.2				
Corresponding Minor Street Approach Volume (v	veh/hr) 3	3	16	16				
Minor Street Total Delay (ve	eh-hrs) 0.0	0.0	0.0	0.0				
A The could be a second of the country of the count								
The total delay experienced for traffic on one minor street appropriately by a STOR sign aguals or exceeds 4 vehicle bours.								
controlled by a STOP sign equals or exceeds 4 vehicle-hours f lane approach and 5 vehicle-hours for a 2-lane approach; AND								
iane approach and 6 veriloic flours for a 2 lane approach, <u>rive</u>	_							
	No	No	No	No				
2. The volume on the same minor street approach equals or exce								
100 vph for 1 moving lane of traffic or 150 vph for 2 moving lan	ies;							ĺ
	No	No	No	No				
3. The total entering volume serviced during the hour equals or	050							
exceeds 800 vph for intersections with 4 or more approaches of vph for intersections with 3 approaches.	or 650							ĺ
vpir for intersections with 3 approaches.	No	No	No	No				
		NT-	No	No				
Signal Warranted based on P	art A? No	No	140	110				Į.

							PM PEA	K HOUF	₹	
			oach nes 2 or More	Existing	Background	Existing + Proj	Background + Proj			
Major Street - Both Approaches	Kains Avenue	Χ		269	271	303	305			
Minor Street - Highest Approach	White Way	Χ		3	3	16	16			
	Signal Warranted ba	sed on I	Part B?	No	No	No	No			

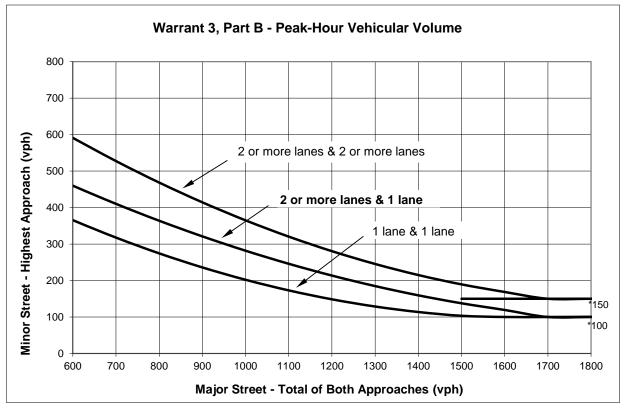
The Warrant is satisfied if the plotted point for vehicles per hour on the major street (both approaches) and the corresponding per hour higher vehicle volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) fall above the applicable curves in California MUTCD Figure 4C-3 or 4C-4.

Source: California Manual on Uniform Traffic Control Devices for Streets and Highways 2014 Edition (FHWA's MUTCD 2009 Edition, including Revisions 1 & 2, as amended for use in California). Notes:

File: Signal Warrant Analysis - White Way\_Kains Ave.xlsm Tab: Signal Warrants 3 (PM)

### White Way and Kains Avenue

PM PEAK HOUR



Source: Figure 4C-3 California Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD 2010 Edition, as amended for use in California).

Warrant 3, Part B - Peak-Hour Vehicular Volume

					PM F	PEAK F	HOUR		
		roach nes	Existing	Background	ing + roj	Background + Proj			
	One	2 or More	Exis	Backg	Existing Proj	Backg + F			
Major Street - Both Approaches Kains Avenue	X		269	271	303	305			
Minor Street - Highest Approach White Way	Х		3	3	16	16			
Signal Warranted Based on Part B - Peak-Ho	ur Volu	ımes?	No	No	No	No			

<sup>\*</sup>Warrant is satisfied if plotted points fall above the appropriate curve in graph above.

File: Signal Warrant Analysis - White Way\_Kains Ave.xlsm

<sup>\*</sup> Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.